American Gas Journal

Formerly American Gas Light Journal

EST. 1859

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WHOLE NO. 3338

NEW YORK, SATURDAY, FEBRUARY 25, 1922

Subscription $3 per year
$4 Canada $5 Foreign

How we create sales for Estate Gas Ranges

Back of Estate gas ranges is a powerful campaign of advertising.

Full Pages in Two Colors in The Saturday Evening Post!

This is the biggest thing in advertising. It creates a demand, stimulates sales, builds profits.

It tells the story of *the gas range with the wonderful oven* in a way that cannot escape attention.

Run through any edition of The Saturday Evening Post and note which pages catch your eye. They are invariably the pages in colors.

Note the Estate ads in the Post. Note that they give definite *facts* about the advantages of Estate Gas Ranges—*definite facts*, not high-sounding generalities.

They are "Selling Talks" to women, brass-tack stuff that puts desire in women's hearts for these fine ranges.

You Get the Benefit of This Powerful Advertising

This powerful advertising is for YOUR BENEFIT. Every ad is aimed to send the purchaser to the Gas Company or dealer selling Estate Ranges. The local dealer profits 50-50 with us in the result of these sales.

All our national advertising is supplemented by local "cash in" tie-ups, advertising matter for you to use locally to create local sales.

Let us tell you of our co-operation—real co-operation that brings results. A line from you will bring the information. Write it today—NOW.

Estate GAS RANGES

MADE BY THE ESTATE STOVE COMPANY, HAMILTON, OHIO—BUILDERS SINCE 1845 OF THE FAMOUS ESTATES. A STOVE, FURNACE AND RANGE FOR EVERY REQUIREMENT —FOR COOKING AND HEATING WITH COAL, WOOD, GAS AND ELECTRICITY

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GAS manufacturers having a daily output of one-half million feet and upwards will be interested to learn that a plant of this type, heated with producer gas, is now in successful operation.

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Retaining cross regenerative construction and all the basic principles which make Koppers Ovens the most successful in the world, this SMALL GAS OVEN PLANT embodies only such changes in detail of design and construction which reduce its initial cost to a point that makes it the CHEAPEST AND MOST EFFICIENT method of manufacturing coal gas.

We Are Prepared to Build Plants of This Type Having a Capacity of a Half Million Cubic Feet Per Day and Upwards.

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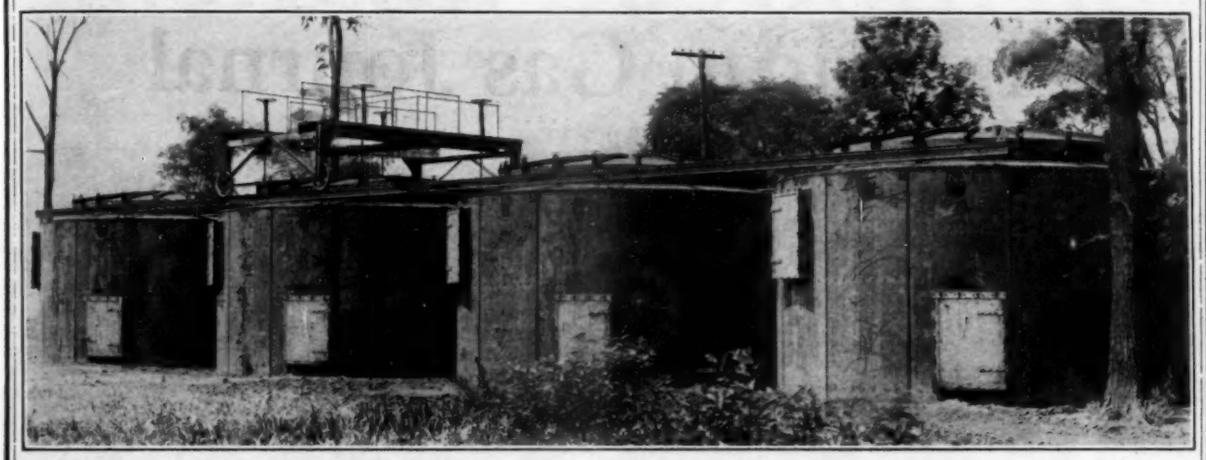
PITTSBURGH



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FOR OUTDOOR OR INDOOR INSTALLATION
FABRICATED COMPLETE IN OUR OWN SHOPS

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CINCINNATI, OHIO

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American Gas Journal

SIXTY-THIRD YEAR

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J. W. Dunbar Made Executive Head of Citizens Gas Company

Congressman Elected by Board of Directors at Recent Meeting

The Citizens Gas Company, of Indianapolis, again is the center of the eyes of students of the gas business. Out of a clear sky there came a change in the personnel of the management of the company the middle of February that indicated many things to those who have watched the development of this great by-product coke plant through its years of operation. The most startling of the developments that became known to the public almost overnight was the selection of a new executive head of the company —James W. Dunbar, representative in the Congress of the United States from the third Indiana district (a district in the southern part of the State).

Dunbar was elected vice-president, executive head and manager of the company at a meeting of the directors, Thursday, Feb. 16. At the same time J. Dorsey Forrest, formerly secretary and manager of the company, was re-elected secretary, but his place as manager was taken by Mr. Dunbar, who is to direct the affairs of the company hereafter. Alfred F. Potts resigned as vice-president to make way for Mr. Dunbar.

Another interesting development of the situation was the fact that the Indianapolis newspapers printed a long list of recommendations recently made to the board of directors of the company by Mr. Forrest, in which in only one instance did the directors concur.

The election of the officers of the company was delayed by the directors this year when several movements for the reorganization of the executive department met opposition. Mr. Dunbar was elected to the board of directors of the company by the trustees about ten days ago and he came to Indianapolis from Washington just before the election of officers to confer with the other directors.

Utility men not connected with the big gas company in Indiana are asking just now whether the reorganization of the company is not one of the final steps of admission that the old methods of providing 60-cent gas for Indianapolis patrons of the company, when gas perhaps was costing more than 60 cents to put in the holder, must be abandoned. These utility men are pointing to the enormous pile of coke now on hand at the Citizens' plant, which has not been disposed of and are questioning whether the long operation of the company on a 60-cent gas basis could have been sound fundamentally.

It will be remembered that the company was forced to go before the Public Service Commission of Indiana some time ago and ask for an increase from 60 cents to 90 cents a thousand cubic feet for gas and that very recently the commission said that the emergency still continues and has allowed the increased rate to remain in effect.

The New Officers

Following are the officers of the company as they were elected at the recent meeting: John R. Welch, president; Mr. Dunbar, vice-president, executive head and general manager; J. Dorsey Forrest, secretary; Gustave E. Efroymson, treasurer; Vincent V. Smith, assistant treasurer; Frederick G. Rastenberg, assistant secretary.

James B. Steep, who has been assistant general manager under Mr. Forrest, will continue as assistant general manager and will be under Mr. Dunbar as soon as Mr. Dunbar takes up active duties with the company. Directors and trustees of the company said that the present arrangement, with Mr. Forrest as manager of the company, will be continued until Mr. Dunbar joins the company on a full-time basis.

"It will be my purpose," said Mr. Dunbar, "to look closely after the relationship of the Citizens Gas Company with the public. I want to get in touch with it and cultivate the friendliest relationship between the company and its patrons. I will talk with citizens who may wish to make complaints and who wish to offer suggestions about the gas company and give the whole business my closest attention.

Will Not Resign from Congress

"No special election will be necessary to fill my place in the Congress. I will come here one week each month to give time to the gas company until the Congress ends its session. If the Senate would dispense with speech-making the Congress should be able to adjourn about June 1. It will not convene until in December and until that time I will be here to give the company my full time. After that time I will return to Washington and come here for a week each month or probably oftener until my term expires March 4, 1923."

The Indianapolis newspapers reported the situation concerning Mr. Forrest's recent recommendations to the directors of the company as follows:

"Mr. Forrest a few days ago submitted to the directors a number of recommendations for a proposed reorganization of the company. The action of the directors to-day shows that these recommendations were not carried out, with one exception.

"Mr. Forrest, among other things, recommended that Mr. Welch be elected chairman of the board of

directors. Instead, the directors re-elected Mr. Welch president of the company.

"Mr. Forrest suggested that Mr. Dunbar be elected president of the company. He was elected vice-president and manager. Mr. Forrest had said that if Mr. Dunbar should be elected president 'there will be no question in the mind of any one who has business dealings with the company as to the proper official to whom he should look for action, although the creation of a chairman of the board will provide an older and more established citizen as the spokesman of the company on matters of broad policy which do not involve consideration of definite and detailed matters.'

"Mr. Forrest had recommended that Henry H. Hornbrook be elected vice-president of the company. This position went to Mr. Dunbar. Mr. Forrest had said that Mr. Hornbrook had acquired intimate knowledge of the company's affairs through his work as chief counsel for the company.

"He is more nearly a working member of the organization than any other member of the board of directors who does not give his entire time to the business of the company,' Mr. Forrest had said in his recommendations.

"Mr. Forrest had suggested that he be elected treasurer. This was not done, as in the change he retained the title of secretary.

"He had said that 'since Mr. Dunbar would not be in position to take up these matters in the near future, I believe this suggestion as to my own position is the best that can be adopted at present.'

"Mr. Forrest had suggested that Mr. Rastenburg be elected secretary of the company. This was not done. He had recommended that V. V. Smith be continued as assistant treasurer. This was not done."

The statement, given out at the executive offices of the gas company following the changes in officers, set out distinctly Mr. Dunbar's long period of service as a gas executive and as a student of gas problems. It said:

"At a meeting of the board of directors of the Citizens Gas Company, of Indianapolis, held on Thursday, James W. Dunbar, of New Albany, now congressman for the third congressional district of Indiana, was chosen to become the active executive head of the company. Mr. Dunbar was elected as a director of the company by the trustees some days ago, and at a conference with the other members of the board of directors yesterday, final arrangements were made for him to enter the service of the company as its active chief executive.

"Mr. Dunbar will not take over the full responsibilities of his new position until after the close of the present session of Congress, which is expected to adjourn in the early summer. Meanwhile, he will spend the major part of his time in Washington, but will return to Indianapolis for one week each month in order to familiarize himself with the business of the company and give to the other officers and directors the benefit of his counsel.

"The directors and trustees of the company feel that not only the company and those interested directly in it but the public at large are to be congratulated on the consummation of arrangements which will bring to this community and to the Citizens Gas Company the services of Mr. Dunbar. His long and successful service in the gas industry, his large circle of friends and admirers throughout the State, his reputation for sterling integrity and uprighteousness and his charm of personality insure for the company and community a real contribution of service.

"Mr. Dunbar has had a unique experience in the history of the gas industry. Born of Scotch parentage in the city of New Albany, he entered the gas service as a lamplighter at the age of eleven years, and from that time until his election to Congress in 1918 he was continuously associated with the operation of gas properties, occupying almost every position from the bottom to the top of the ladder.

"From 1894 to 1906 he was secretary of the Western Gas Association. From 1906 to 1908, secretary of the American Gas Institute. He has been twice president of the Indiana Gas Association, and from 1913 to 1918 he was its secretary. Probably no man in the country has a broader acquaintance in the gas industry, and he has at all times kept up with the progress of the industry.

"His local popularity is attested by the fact that he is the second Republican ever to be elected from the strongly Democratic third district, having been first elected in 1918 and re-elected in 1920. He was Republican presidential elector-at-large for Indiana in 1916, and at various times was a member of the city council of New Albany, member of the board of school trustees and sinking fund commissioner.

"At the time of his election to Congress he was the vice-president and general superintendent of the United Gas & Electric Company, operating the gas and electric properties in the cities of New Albany and Jeffersonville.

"Mr. Dunbar is married, but has no children. After adjournment of Congress Mr. and Mrs. Dunbar will move to Indianapolis and actively identify themselves with the community life."

Comments on "Coal Manual"

The following review of "Coal Manual," by F. R. Wadleigh, appeared in a recent issue of *Railway Age:*

Numerous books dealing with the subject of fuels and coal have been issued from time to time, but they usually have been written from the technical viewpoint of the engineer or chemist, or to meet the needs of the man in charge of power plants or locomotives. Few books have been available, however, which gave in a concise and accurate manner the general elementary information desired by a large number of men, such as purchasing agents, storekeepers and others who are more or less interested in some phase of the coal question other than that of actual mining. This manual has been prepared by a man who evidently knew his subject and in addition recognized the wants of the men for whom he was writing.

The subject matter has been well arranged and by the use of frequent subheads and an excellent index any information desired can be found readily.

Among the subjects covered are: Kinds and commercial grades of coal; information in regard to the location of coal fields and the essential differences in the character of coal from various fields and seams; the preparation of coal; coke and gas manufacture; the use of coal in locomotives, stationary boilers and furnaces; storage and prevention of spontaneous combustion; specifications and their use; analyses and effects of various impurities, together with a brief bibliography on the subject of coal.

Industrial Uses of Gases

Various Angles on This Important Subject

Selling Gas-Steam Boilers

By E. W. BERCHTOLD

Not every gas salesman is adapted to handling the sale of a gas-steam boiler. If the salesman is not familiar with steam work, he should have the company's engineer go over the prospect with him, not in his office, but he should see the actual equipment which the boiler is going to handle. He should ask as many questions as possible, pertaining to the kind of work, amount, and the temperature necessary to do this work. The size of the boiler must be based on the maximum hourly production. Each plant needs special consideration.

There are a great many opportunities for gas-steam boilers, and every gas company, large or small, should make every effort to bring them home.

Our greatest competitor is the coal man, therefore our argument generally is against coal. The customer usually figures fuel only until his attention is called to other expenditures, such as, labor, for shoveling coal, loss of coal in cleaning fires, cost of ash cans, carting of ashes, dirt from smoke and soot, irregularity of steam pressure, slowing up production; keeping banked fires all night so that steam may be had for early morning use, capital tied up in coal and coal storage space, and a great many times the shortage of coal which will cause the customer more worry than any gas bill.

It is much better for him to install a gas boiler, doing away with all these troubles, many of which can be avoided by placing his boiler near his work, and getting hot, dry, steam. "Automatic devices on the gas boiler keep the steam pressure constant, therefore give better production."

There will be no engineer to trouble him on plants of boilers up to twenty-four inches in diameter. On larger boilers where it is necessary to employ an engineer, the engineer's time can be devoted to some other work, as the gas boiler does not need his service all the time, and such a man can earn his wages in many ways throughout the factory.

The cost of fuel on the gas boiler depends entirely on production. When production is stopped, the fuel cost stops. Steam is easily gotten up at any time. It is not necessary to look into the coal bin or to carry cordwood. All that is necessary is to light the pilot and turn on the gas, and in a short time everything is ready for operation. The time for getting up steam on a gas boiler varies considerably, depending entirely on the equipment attached. If the stop valve of the boiler is closed, it generally takes twenty to thirty minutes to obtain fifty pounds. In most of the small boiler plants, the load is very irregular, and there is nothing better than a gas-fired boiler to handle such plants, because they can follow the demand. It is impossible to compare the gas boiler with the coal boiler because the designs are so different. A gas-steam boiler is constructed so as to burn gas at a very high thermal efficiency. In the gas boiler of the fire-tube type, the tubes should be numerous, and small in diameter in order to bring the products of combustion in a more direct contact with the water and steam in the boiler. It is automatic, as I mentioned above, and placing it near the equipment for which it is installed, gives an advantage by getting dry hot steam and less radiation loss through piping. We must always remember our problem is the application of heat. The sooner the heat that is in the steam after leaving the boiler is delivered to the point of use, the greater will be the efficiency of the plant.

The members of the New England Association of Gas Engineers heard with a great deal of interest the papers which are presented here under the above general head. We feel sure our readers will find them as interesting.—Editor.

A coal boiler is constructed to burn ordinary coal. No two coals are alike, no two chimneys have the same draft. Even the same chimney is affected by the changes of wind, and atmospheric conditions. In one case more steam than is necessary would be made, and another time it would be difficult to get steam enough. Poor firing also affects the efficiency. Up to the present time, the coal boiler has not been made entirely automatic. Considering the above, the efficiency of the coal boiler is very uncertain. Boiler repairs are much higher on the coal boiler. Replacing of burnt grate bars, and deterioration of plant from wetting ashes around boiler count up quickly.

Gas-steam boilers may be divided into two classes, high and low pressure. By high pressure, I mean any pressure over fifteen pounds gauge. By low pressure, I mean below fifteen pounds gauge. High pressure boilers are excellent appliances where high

temperatures are desired, such as candy factories, where the use of vacuum kettles is employed. They are also used in the following instances: Hat factories for hydraulic presses, driers and hat steamers; creameries, for pasteurizing milk, heating water, washing cans and bottles; refrigeration plants of the absorption type, for heating the aqua solution in the generator. Shoe factories for toe-steamers, dry rooms and wax heaters. Clothing manufacturers, for pressing irons, ironing machines and sponging machines; baker supply companies for cooking pie fillings, jellies and creams; bakeries, for steaming ovens.

The low pressure boiler should be used wherever possible. It has proven more satisfactory to operate than the high pressuer boiler. This is principally on account of greater efficiency. The higher the steam pressure, the greater will be the temperature, consequently the higher the pressure, the greater will be the flue gas losses. The high pressure boiler is not so easily equipped with automatic water feeds. On the low pressure boiler, an automatic feed is easily installed, and very inexpensive, and gives the customer a more completely automatic gas-fired steam boiler.

Some Recent Installations in Boston

Installations recently made in Boston with low pressure boilers are as follows; packing houses for heating dressing rooms, and heating water for laboratory use; nickle-plating works, for heating electroplating tanks; hosiery mills, for hosiery drying forms; creameries for pasteurizing milk; dress plaiting works for steaming ovens.

A few of the many questions that will have to be answered in selling gas boilers are given herewith:

1. How large a boiler do I need?

The boiler should be large enough to maintain a constant pressure at maximum demand.

2. What will the boiler cost?

Quote the price of the boiler delivered. If figures have to be made for installing, it is much better to quote on the entire installation ready for work. In most cases the piping costs are as much as the boiler itself.

3. What will it cost to install?

There is only one way to handle this and that is to have an estimate made, and quote with the boiler.

4. What will it cost to operate?

Quote the rated gas consumption of the boiler. You must be careful and not stop at this point. Be sure to impress on the customer's mind that the gas consumption of the boiler means nothing by itself. and it is impossible to determine the monthly gas consumption, even approximately, for this plant consumption depends entirely on production, and as the boiler is automatic, all variations in steam requirements are credited by the gas regulator.

5. How much more will it cost than coal?

Do not allow your customer to compare gas with coal, as I explained above.

6. Will it maintain a certain pressure?

Yes, this pressure will be constant. Always be careful to get the proper size boiler for the job. If the boiler is not figured large enough, it will be only a short time before it is back in the warehouse of the gas company, and it is better not to sell at all, if the proper size cannot be installed.

The Safety Feature

7. Is it safe?

It is safer than any other type of boiler. The fire can be instantly shut off, whereas in the coal boiler, it is necessary to cover the fire with ashes or coal, and then the heat is only partially done away with. If the fire is hauled out, a more terrific temporary heat is created. The gas boiler is automatic and excess pressure is eliminated. In the coal boiler, it cannot be readily checked.

8. How long does it take to get up steam in the morning?

On the boiler, without equipment attached, it takes twenty to thirty minutes for about fifty pounds.

9. Do I need an engineer?

In Massachusetts, any low pressure boiler with police safety valve can be operated without a licensed engineer. This also applies to high pressure boilers twenty-four inches in diameter and under. It is necessary to employ an engineer on high pressure gas boilers over twenty-four inches in diameter.

10. Where will I set the boiler?

Always place your boiler as near the equipment as possible. The gravity return system in many cases is the most satisfactory. In this case, the boiler is placed on the floor below the equipment if possible, and take steam lines from the boiler to the different appliances. The returns from the appliances should run back to the lower part of the boiler using check valves at each appliance, and one at the boiler. In those lines, the only losses are those of radiation. If the boiler is placed on the same floor as the equipment, it is necessary to install either return traps and receivers, or pumps and receiver.

Avoid This Pitfall

11. How long would it take for delivery?

Never specify a definite date. Always do your best to get the boiler on the job as soon as possible. Delays mean cancellations.

12. Does your boiler pass the required inspection?

Each State has its own boiler laws, and the salesman should make himself familiar with them, so that he may answer properly.

13. Could I add more equipment to the boiler you specify?

Do not give the customer permission to add any more equipment to the boiler. In most cases they will overload the boiler, and it will eventually mean the loss of a gas consumer.

14. Where do I save by using gas?

The customer saves by having a hot, dry steam when and where he wants it at a short notice. It is the most efficient fuel for the different kinds of work mentioned.

15. How much pressure can I carry?

Know the type of boiler you are selling, if it is high pressure, it generally means any pressure from zero to a hundred pounds. Dimensions are usually given in the manufacturer's catalogues.

17. How much does it weigh?

Manufacturer's catalogues usually give the shipping weight, which answers for the purpose.

18. Where can I see one working?

This is where you sell or lose the boiler. If you have been on your job, you will have some very good plants to show him. Always tell the truth, never misrepresent your goods. If you do, you are in danger of being caught, and you will lose the sale. In case you sell the boiler, and you have misrepresented anything, it is worse than ever. Always sell a customer what he should have, rather than what he wants. When a gas salesman once sells the customer, he then becomes a consumer, and he deals with the company thereafter. Always be sure that you are right. Know your boiler and what it will perform, and you will work up a nice steam boiler business for your company.

Gas in Large Kitchens for Cooking Purposes

By L. J. JOYCE

Where Business Is to Be Found—Hotels, restaurants, clubs, hospitals, large industrial concerns, department stores and bakeries.

Kinds of Appliances on Hotels—Ranges, broilers, toasters, bake ovens, steam boilers and refrigeration plants.

The getting of hotel business is not always an easy proposition and this class of business must be followed consistently.

The hotels, as we found them in Boston, were all equipped with coal ranges, many of them using coal almost entirely, and the only argument we had to offer the hotel man was that he could get better service. We even sometimes had to ask him to scrap a perfectly good coal range, for which he could get little or no compensation, while in many cases we found that their ranges were in such condition that they were not worth saving.

With gas in his kitchen, he had a more efficient kitchen, one that was clean and without noise from stoking fires, and a kitchen that was ready at any hour of the day or night to give service. In one case guests had been excessively annoyed from the early activities in the kitchen. After the gas kitchen was installed here, this trouble disappeared entirely.

We could not tell the hotel man that his fuel would cost less than coal, although in one of two cases this has been a fact. We tried in a number of houses to get data on the cost per meal, but we found this most unsatisfactory, some similar types of service giving entirely different results as to costs. In one case a club serving about 6,000 meals per month, where we have removed their electrical installation, we cut their bill in half, the average cost of gas per meal in this case being 1.55 cents. A certain hotel serving 5,453 meals per month found its cost in the kitchen divided up as follows:

Cost for provisions	$0.615
Labor	0.370
Laundry	0.035
Gas	0.034
Total cost	1.050

The cost of gas was only 3 per cent of the total cost, smaller even than the kitchen laundry.

Encountered Hostility

We found in the early days of our hotel campaign that the chef was almost invariably hostile to the use of gas, and we had to overcome his objection as well as the hotel owner's. One case that I have in mind was in one of our best and largest restaurants, where the chef declared himself absolutely hostile to the use of gas, except possibly for the toasting of bread. The proprietor of this house told me that if I could get the chef to use gas, he would be willing to pay for the installation. This was certainly a difficult job but, after calling repeatedly on the chef, I got to be rather friendly with him. We had, at this time, placed on our sales floor, two sections of Garland hotel range, connected. I went over to this chef and told him that I wanted his advice as a practical man on the construction of the stove, and asked him if he would be willing to look it over, without any idea in mind of asking him to buy it, but that I wanted his opinion as a practical man on the stove construction. He came with me and I lighted the stove and showed him the operation of the burners, and it was very apparent that he was much impressed with the range. After looking it over thoroughly, he turned to me and said, "I will go back and ask my boss to buy this range." This man, afterward was a steady and consistent booster for gas, and the proprietor became even more enthusiastic than the chef. After installations were made in hotels, we found that the chefs were the first to realize that their work was easier and that they always had a fire and were not dependent on firemen in any way whatever.

In many hotels, we found that they were using the old type of brick oven, coal or coke fired. In some cases, we succeeded in changing them over to gas and have had very good results.

It is imperative that appliances in hotels be maintained, either by the hotels themselves or by the gas companies. If this is not done systematically, we have complaints of high bills, and unsatisfactory results, and no matter how careless the people are who use these appliances, the blame is laid at our door. I believe, myself, that it is wise for the gas company to get the maintenance of these appliances wherever it can. This, we have been doing. In the past, we had a system of free maintenance; that is, our men corrected and cleaned ranges, regulated burners and, in fact, did all the work except replace parts, free of charge. We now make a nominal charge for this work, and I think that it is a necessary thing to do. I have always felt that men value things in proportion to what they pay for them. There is no reason in my mind why maintenance should not be paid for. When they were using coal ranges they had to pay for this, and they did not complain, and I can see no reason why the gas company should give this maintenance without charge. I think that we should make simple adjustments without charge, but do not think we should go further than this. Our present policy is to adjust anything free, that can be done with a screwdriver and pair of pliers.

A Source of Trouble

We have had considerable trouble with broiler burners. The old iron-pipe burner in the broiler is subjected to a very high and constant heat and the

iron does not stand under this test and in a very short time the burner sags and gives away. We have overcome this very successfully with the use of nichrome burners. These burners are practically indestructible. We have one case where these burners were used eighten months, and are as good as when the installation was made and have given excellent satisfaction. We have sold quite a number of these and expect to sell many more. The cost price of the iron burners was $10 a set, whereas the cost of the new is $65 a set, but there can be no question but what the installation of nichrome burners pays in the long run. It is not necessary to use the nichrome burners on the No. 630 Garland broiler. We also found that there was a tendency to use too much gas in the tops of the ranges and this should be watched carefully and corrected wherever found. We have found it helpful to use a flue gap on the ranges. We have found in many cases that we got poor ventilation and imperfect baking and slow ranges, and have improved this by the use of the flue gap.

Gas in Hospitals

We have practically all of the hospitals in Boston equipped with gas, with only one or two exceptions. Any hospital superintendent will agree with you that coal is not the fuel for a hospital. We find that with the hospital that is being built to-day, it is not a hard matter to convince its management that gas is the fuel for them. Aside from the fact that it is a more efficient fuel for their work, it is also sanitary, and is always ready to give service. We find that in hospitals, gas service has been most successful. In the case of the Consumptives Hospital at Mattapan, they maintain an entirely gas kitchen, and we had a special type of range built for them, where they could operate from both sides of the range. This was composed of two double sections back to back with a dividing flue between sections, and the ranges set in the middle of the kitchen. We found that this worked out very successfully, the fry cooks and pastry cooks working on one side and the vegetables and other things could be taken care of from the other side. In this case there was a very careful analysis made of the cost by Dr. Simon B. Cox, who was then superintendent of that institution, and their own figures which were made most carefully, showed a saving in favor of gas, covering a period of two years. This work has now been installed about eight years and is still doing splendid work. The appliances used in hospitals are ranges, broilers, toasters, bake ovens and in new hospitals, there should be opportunities for steam boilers and for refrigeration systems also incinerators.

Large Industrial Concerns and Department Stores—Restaurants for Help

This class of business has grown immensely during the past few years. We have very fine kitchens installed in our department stores. These restaurants are run on the co-operative system and the stores feed their help at about cost. They realize that it is a good policy to feed their employees on their own premises, for they can give them a better meal than they could ordinarily get in a restaurant for less money. Appliances used in this class of business are ranges, broilers, steam tables, coffee and hot water urns.

Restaurants

The larger type of restaurant is using gas quite generally in Boston. Space for storing coal is important. Quick, efficient service is the all-important thing for large restaurants, as people who come there have limited time, and must have service. The use of gas is the only absolutely sure way to get this. In the smaller restaurants, we find a number of coal ranges still being used. This is especially true in restaurants being conducted by the Greeks. These people seem to think that the cost of fuel alone is the deciding factor as to the kind of fuel they use. Gas is cheaper and better for many reasons. Gas is clean, it requires no space for storage, you are not handling coal or ashes which make dirt in the kitchen, you have a fire at any minute and, when all things are considered, it will be found to be as cheap as coal.

In conclusion, I would say that the experimental period of gas for cooking has long since passed and there can be no doubt in the minds of any one, but that gas will do all that coal will do and do it better. We should have all of this business, but the foreign restaurant keepers, principally the Greeks, seem to still remain a problem as they do not seem to see anything beyond the first cost. But they are falling into line and it is only a question of following after them constantly.

A Few of the Thousand Uses for Gas

By P. J. LAFORE

It is a common saying that there are a thousand uses for gas. I will endeavor to describe some of the uses to which gas is put in Boston, in the heat-treatment and melting of metals.

Possibly the most common use of gas in the metal trade is in the heat-treatment of steel and the melting of metals which have low melting points.

In addition to doing this, we are obtaining very satisfactory results in the melting of the more difficult metals, such as aluminum and copper; in furnaces for tinning wire, copper annealing furnaces, melting of type metal in newspaper offices, and furnaces for the special heat-treatment problems for steel. The subject of the more common steel heat-treating problems, such as hardening, tempering, annealing, case hardening, lead hardening, salt hardening, small forge work, etc., is so large that I will not deal at length with it, but will confine myself to the work mentioned above. It has been my experience that there are few jobs that we cannot do to advantage with gas, provided that we give the matter sufficient thought and attention, and our customer is willing to pay a fair price for the furnace.

We have quite a number of furnaces in Boston for the heat treatment of steel, some of which use the high-pressure gas single-valve system, while others are of the two-valve pressure air system, both giving excellent results. Personally, I prefer the one-valve system (of which there are a number of satisfactory types on the market) to the two-valve system. I say this because it has been my experience that it is difficult to adjust the two-valve system to obtain good combustion and even when so adjusted, the propor-

tions are seldom maintained for any length of time. In addition to this, the average operator is not a skilled gasman, and neither knows, nor will take the trouble to make the correct adjustments, every time he has to start or change the temperatures in his furnace. On the other hand, with some of the other types of furnaces on the market, very little is left to the operator in the way of adjustments, and the results are usually very much better than with the two valve system.

In addition to the ordinary run of heat-treating furnaces for steel, that are common everywhere, there are two rather unusual installations on our lines. One of these is at the Watertown Arsenal. The other is a large installation that was put in last winter for a commercial heat-treating concern. It is not my intention to discuss the subject of the heat-treating of steel in this paper, except in the case of one installation which I will describe later. I only mention these as they are both very large installations running into many thousands of dollars and are turning out work that is very excellent, and in the case of the Watertown Arsenal, of very unusual character.

Furnaces for Tinning Copper

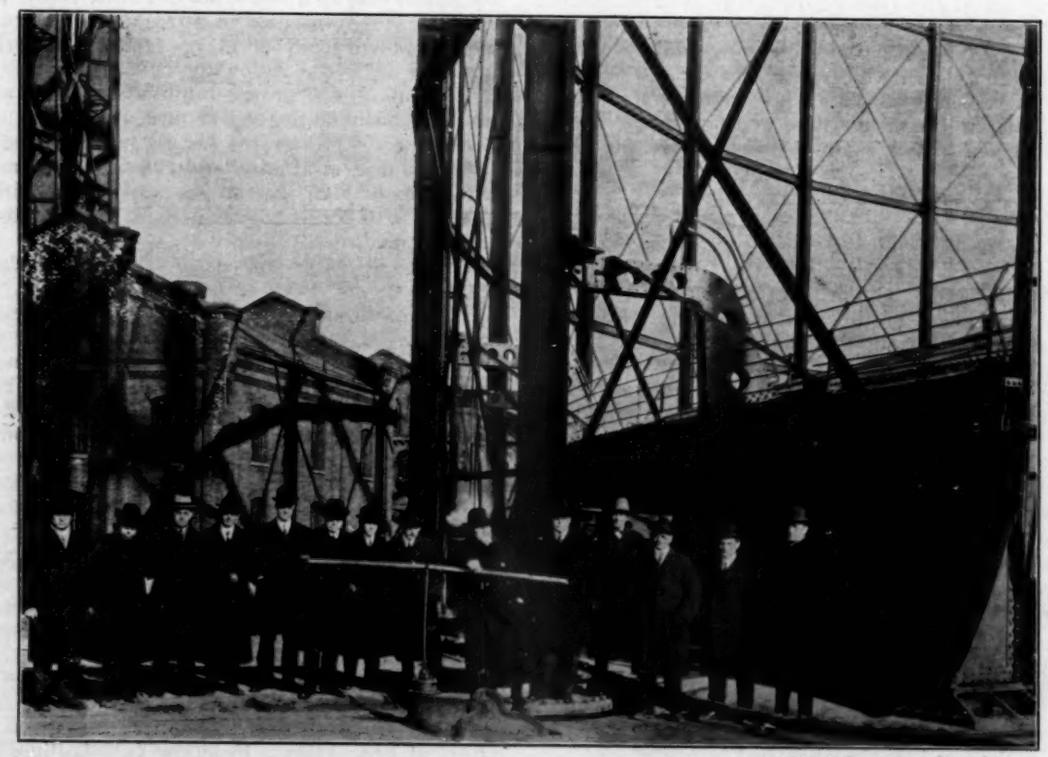
Some of the other installations that have been made are as follows: Furnaces for the tinning of copper wire that is used for electric cords, etc. These furnaces have a cast-iron shell, fire-brick inside, and insulating material between. They are fired with a single tuunel burner placed at one end, and fired lengthwise of the furnace under the pot.

Very uniform heat is obtained throughout the mass of tin, and there is very little change in temperature during the run. This is very important as any great variation in temperature will cause an uneven covering of tin on the wire and leave bare spots, and may even injure the copper wire, if the temperature is allowed to go too high.

In the same place, we have installed burners in a Kenworthy annealing furnace for copper wire. I will describe this furnace briefly for those of you who are not familiar with its construction. It has a steel cylinder or shell with fire-brick lining, inside of which is a combustion chamber formed by the fire-brick and inside steel cylinder. There is a water seal at the bottom through which the wire in the form of a coil is lowered and then raised into the inside cylinder. The steam is admitted during the heat to prevent the air from being drawn in and oxidizing the wire, it being very important to prevent oxidization.

The furnace is fired by means of four gas burners placed tangentially in pairs on opposite sides of the furnace. They are placed one above the other near the bottom of the furnace. When we first installed the burners in the furnace, we had considerable trouble, as the pyrometers showed a very great variation. These pyrometers went through the combustion chamber and protruded for a few inches in the working zone, and we noticed that the exposed parts of

(*Continued on page* 193.)



Gas for the first time was turned into the new 15,000,000 cu. ft. holder at Astoria, Long Island, on Jan. 8, 1922. The late William H. Bradley, chief engineer of the N. Y. Consolidated Gas Company, is seen with his forearm resting on the bar. This is the last photograph taken of Mr. Bradley, who died ten days later. George B. Cortelyou, president of the Consolidated, is at the left, clutching the bar in the act of turning gas into the holder

Unsaturated Hydrocarbon Constituents of Gas

Determination from Destructive Distillation of a Water-Gas Tar and Coal Mixture

By RALPH L. BROWN, Associate Organic Chemist, U. S. Bureau of Mines

The chemical properties of the unsaturated members of the aliphatic series of hydrocarbons are such as to render them "made to order" starting points or basic materials for the synthesis of hundreds of important organic chemicals. The tremendous quantities of these unsaturated compounds that are being produced daily in the various coal carbonization and oil refining processes, and which at present have little value other than that of fuel, render a survey of the identity and extent of occurrence of these compounds important from the viewpoint of economic utilization and resource conservation. The increased need of liquid fuel and the relatively early exhaustion of petroleum resources will eventually require every utilization of liquid fuel products obtainable directly or indirectly from coal. Accordingly, the Bureau of Mines took advantage of an opportunity for examining the gaseous unsaturated hydrocarbons found in the gas obtained when a mixture of water-gas tar and coal is distilled in a gas-making retort. Collection of the material for examination was made possible through the courtesy of the Trent Process Corporation, Washington, D. C., which was at that time carrying on at the Georgetown Gas Works, distillation of "amalgams" prepared from various coals and oils by the Trent process for cleaning coals. Kanawha gas coal (70 per cent) and water-gas tar (30 per cent) from the Washington Gas Light plant were used in the "amalgam" being distilled at that time. The results obtained in this examination are presented here.

Method of Procedure

The method* employed in general was to collect the unsaturated compounds in the form of their dibromide derivatives at the plant and to isolate the individual members of the mixture in the laboratory. During the collection, the gas was drawn from the system after removal of the tar and ammonia had been effected. It was then led in turn through NaAH solution and over solid NaOH for the removal of H_2S, through a large cartridge of activated gas mask charcoal to remove oils and vapors, through a meter for rate and volume measurements and finally through a train for the absorption of unsaturated compounds. The train consisted of a series of three bottles containing a layer of bromine covered by a little water. Three such trains were used in parallel and were kept in a bath whose temperature was maintained at approximately 5 deg. Cent. Full cognizance was taken of the work of Read and Williams (Jour. Chem. Soc., vol. 111, p. 240 (1917). Also Read and Hook, Ibid. vol. 117, p. 1214 (1920)) who reported that when ethylene was passed into bromine water, approximately one-half the absorbed bromine, and consequently a proportional quantity of the absorbed ethylene, go to form the bromohydrin, while less than the remaining one-half forms ethylene dibromide. It has, however, been found experimentally (as indicated by theory) that if the entering gas first comes into contact with the bromine as in bubbling through it, the amount of bromhydrin formed is negligible for the purpose. The possibility of bromhydrin formation may be also avoided by omitting the water from the first bottle containing bromine. Most of the absorption of the unsaturated compounds occurs in the first bottle.

The total volume of gas passed was 40 cu. ft., and the average rate of flow through the apparatus was 7.2 liters per hour. The crude bromides produced and collected were washed with Na_2CO_3 solution and water and dried with $CaCl_2$.

Fractionation

A quantity of these crude bromine derivatives was fractionated under diminished pressure in an atmosphere of nitrogen. The distillation flask was heated by immersion in a liquid temperature bath, while the receiver was immersed in a freezing mixture. There were obtained from 543 grams of crude material, three portions with the following characteristics:

Portion 1—430 grams (equivalent to 79 per cent) boiling below 60 deg. at 12 mm.

Portion 2—14.5 grams (or 2.7 per cent) boiling between 60 deg. at 12 mm. and 125 deg. at 35 mm. The evolution of HBr due to decomposition with consequent rise of pressure was evident and the distillation was stopped.

Portion 3—94 grams (or 17 per cent) of black tarry residue.

The fractionation of Portion 1, after being thoroughly dried, was first begun at atmospheric pressure, but evidence of decomposition appeared and it was continued under diminished pressure. The crude fractions corresponding roughly to the dibromides of ethylene, propylene and combined homologues were then fractionated in order at atmospheric pressure, using an eight-inch column. The final fractions were (a) 15 grams of boiling range 79-83 deg.; (b) 228 grams of boiling range 125-135 deg.; (c) 96.5 grams of boiling range 135-145 deg.; (d) 25 grams of boiling range 145-165 deg.; (e) 14.6 grams of boiling range 165-180 deg., and (f) a solid residue of 10.5 grams. There was a loss of 40.4 grams of substance.

Physical Properties

These fractions were then examined as to their physical properties. Fraction (a), boiling between 79 and 83 deg. Cent., was found to have at 20 deg. Cent. a specific gravity of 0.8858 (pure benzene D 20 ÷ 4 = 0.8799) to contain only traces of bromine and to possess the characteristic odor of benzene. This fraction was therefore considered to be benzene.

*See Norton and Andrews, Am. Chem. Jour., vol. 8, p. 1; Zanetti, Jour. Ind. and Eng. Chem., vol. 8, p. 676, and vol. 9, p. 474; Sennatt and Slater, Gas Jour., 1920, p. 695.

Table 1—Properties of the Four Fractions, with Those of Pure Dibromides

Material	Boiling Point	Sp. Gr. at 20°	Bromine %	Carbon %	Hydrogen %	Total
Ethylene dibromide	131°	2.178	85.07	12.78	2.16	100.01
Fraction (b)	125-135	1.982	81.10	16.70	2.71	100 50
Propylene dibromide	141.6°	1.933	79.17	17.84	2.99	100.00
Fraction (c)	135-145	1.942	79.40	17.83	2.89	100.10
Butylene dibromides	148, 166, 158	1.79-1.820	74.03	22.24	3.73	100.00
Fraction (d)	145-165	1.760	71.77	24.76	3.61	100.14
Amylene dibromides	170-190	1.60-1.706	69.51	.....	....	.....
Fraction (e)	165-180	1.629	63.30	.....	....	.....

The next four fractions, namely (b), (c), (d) and (e), were examined by determining the specific gravity, analyzing for bromine (by the method of Carius), carbon, and hydrogen. The results of these determinations are given in Table 1 in which are placed for purpose of comparison, constants for the pure dibromides of ethylene, propylene, butylenes and amylenes.

Discussion

As regards fraction (b), consideration of the specific gravity and the analyses at first seemed to indicate that this fraction was badly contaminated with propylene dibromide. However, repeated efforts to eliminate the latter by fractional distillation led to the conclusion that the impurity—material other than ethylene dibromide—must be a compound of lower bromine content and higher carbon and hydrogen content than ethylene dibromide, and yet with a boiling point quite close to that of the latter compound. Assuming the bromine content of this fraction to be present entirely as ethylene dibromide, the improbability of the impurity being a simple hydrocarbon is seen from the total nonconformity of the calculated specific gravity of such a mixture with the measured value of the fraction. A survey of the monobromo derivatives of the aliphatic and aromatic series of hydrocarbons led to the belief that monobromopentane (which has a boiling point 129 deg., D 20 ÷ 4 1.2234 Br_2 content of 52.9 per cent, carbon content 39.7 per cent, and H_2 content of 7.35 per cent) might be the impurity provided it is formed under the conditions that existed. On the assumption that monobromopentane is the only impurity of consequence, simple algebraic calculations based on the bromine and carbon content of bromopentane and ethylene dibromide on the one hand, and the values found by analysis for fraction (b) on the other hand, indicated the same relative proportions in which the two compounds could be present. An approximate average of the two values arrived at showed 87.5 parts of ethylene dibromide and 12.5 of bromopentane, and on that basis the calculated values for the hydrogen content and specific gravity agreed, with those found for the fraction. The values follow:

	Bromine %	Carbon %	Hydrogen %	Sp. Gr. D 20÷4
Calculated	81.05	16.2	2.81	1.984
Found for fraction (b)	81.10	16.7	2.71	1.982

More positive evidence of the presence and identity of the impurity was sought by causing a quantity of fraction (b) to react, in one experiment with a zinc-copper couple,† and in a second experiment with an Al-Hg "Metallpaar,"‡ and the resulting gas and vapor passed through a coil cooled to —10 deg., to remove alcohol and unreacted substances by condensation, and then through a coil cooled to —70 to —80 deg. and finally into bromine cooled to 5 deg. In a catch bulb on the second coil, a small quantity of liquid was obtained to which a little ice water was added and the bulb shaken. An upper layer of oil separated which, when tested by the Menzies method for determining boiling points of small amounts, boiled from 32 to 35 deg. The ethylene dibromide recovered from the bromine in this experiment was found to be practically pure. Further work on the identification of the impurity under question being impossible through a lack of more of fraction (b), the latter was considered to be 87.5 per cent of ethylene dibromide and about 12.5 per cent of material which the evidence seems to indicate is a bromine derivative of pentane. In this connection, it may be mentioned that the constants and properties of $CH_3CH_2CH_2CBr{:}CH_2$ would permit it to be considered here in the same proportion. However, the agreement between the calculated specific gravity for such a mixture (1.942) and that found (1.982) is not so close.

In fraction (c), in view of the conformity of its specific gravity, boiling range and composition with that of propylene dibromide, the fraction was considered to consist practically entirely of that compound.

In fraction (d) it is seen that other material than butylene dibromide (of which there are three isomers theoretically possible) must be present. As in fraction (b), saturated hydrocarbons may be eliminated and among the monobromo derivatives that might be possible impurities, monobromobenzene and monobromohexane are the most likely. Calculations based on carbon and bromine content showed that approximately ten parts of either compound with 90 parts of butylene dibromide would give a mixture close in properties to fraction (d). On the other hand, consideration of the specific gravity of the same two mixtures demands that the greater part of this impurity

†Gladstone and Tribe, Jour. Chem. Soc. 45, 154 (1884), Ber., 6, 202, 454 and 1153 (1873).

‡Wislicenus, Jour. prakt. Chem., 54, 52 (1896).

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be monobromobenzene to have the same specific gravity as measured for fraction (d) (calculated 1.764, measured 1.760). In view of the fact that paradibromobenzene was isolated and identified in (e), and in Portion 2, and that fraction (d) amounted to only 25 grams in all, it was considered that fraction (d) consisted of butylene dibromides containing 10 per cent of monobromobenzene.

In view of the divergence of the constants of the isomeric amylene dibromides and the small total amount of fraction (e), the latter was taken as an approximate measure of the amylenes and any further unsaturated compounds in the gas.

At the close of the fractionation in vacuum of Portion 1, there formed as a sublimate of the residue (f), monoclinic tablets perfect in form, entirely colorless, melting without recrystallization at 87 deg. From the final combined residue of Portion 1, paradibromobenzene was obtained and identified by its melting point (88-89 deg.) and its bromine content. Three grams were isolated by crystallization at low temperatures.

From Portion 2, obtained in the first distillation, approximately 3 grams more of paradibromobenzene were separated by crystallization. The residual mother liquor 7.6 grams, showed on analysis a bromine content of 69.99 per cent, whereas for dibromobenzene theory demands 67.74 per cent. The specific gravity at 20 deg. was 1.954 and that for ortho and meta dibromobenzene is 1.977 and 1.955 respectively (at 18 deg.). This mother liquor was considered to be largely a mixture of dibromobenzenes and no further attempts at isolation and identification of the constituents were made.

Portion 3, the residue from the original distillation, as previously stated, was a black pitchy mass. The ether extract separated a dark liquid amounting to 87.5 grams which, on being well cooled, yielded 25.5 grams of tetrabromobutane (1, 2, 3, 4) derivative, which was identified by its melting point (115-6 deg.) and its bromine content. (Theory demands 85.53 per cent; found, (a) 84.43 per cent (b) 85.08 per cent). The crystals were orthorhombic. No further products were isolated from the 62 grams of mother liquor. The ether extraction residue (from Portion 3) was 6.5 grams of carbon particles of less than micron size and resembling carbon black. They were a product of decomposition during distillation. The presence of the 1, 2, 3, 4 tetrabromobutane undoubtedly indicates the presence of 1-3 butadiene in the gas.

Thus in addition to condensable oils, largely collected by the charcoal, and those gases unaffected by the bromine (CO_2, 1.6 per cent; O_2, 0.5 per cent; CO, 5.3 per cent; H_2, 35.5 per cent; CH_4, 42.5 per cent; N_2, 6.6 per cent) the gas under examination contained constituents—forming about 6 per cent of the total gas volume—which are grouped together in Table 2 in the form and quantity in which they were isolated.

Table 2—Hydrocarbons Collected as Bromide Derivatives (469.5 grams)

I	
Benzene	15.0 grams
Ethylene dibromide	200.0 grams
Monobromopentane (?)	28.0 grams
Propylene dibromide	96.5 grams
Butylene dibromides	22.5 grams
Monobromobenzene	2.5 grams
Amylene dibromides	14.5 grams
Paradibromobenzene	3.0 grams
II	
Paradibromobenzene	3.0 grams
Liquid dibromobenzenes	12.0 grams
III	
Tetrabromobutane	25.5 grams
Liquid residue	62.0 grams
Carbon	6.5 grams
IV	
Total working loss	52.0 grams

The amounts of the unsaturated hydrocarbons in the gas calculated from the values just given are presented in Table 3. In view of the present-day interest in one utilization of olefin hydrocarbons from commercial scale sources of production, namely, the production of their corresponding alcohols, the theoretical equivalents of the unsaturated hydrocarbons are included. The table follows:

(*Continued on page* 190.)

Table 3—Calculated Amounts of Unsaturated Hydrocarbons present in the gas

	Per 40 Cu. Ft. of Gas			Per 1,000 Cu. Ft. of Gas		
	Dibromides	Hydrocarbons	Theoretical Alcohol Equivalent	Hydrocarbons		Theoretical Alcohol Equivalent
Material	Grams	Grams	Grams	Grams	Cu. Ft. at 25°	Gallons
Ethylene	200.0	30.00	49.3	1,230	23.10	0.415
Propylene	96.5	20.10	28.8	720	10.34	0.238
Butylene	22.5	5.35	7.7	193	2.25	0.063
Amylenes	14.5	4.42	5.6	139	1.36	0.045
Butadiene	25.5*	3.70	...	...	....	.....

*Represents that which was actually isolated as the tetrabromo derivative; the amount present would be larger.

As the Journal Views It

The Coal Situation

Gas company officials are greatly concerned over the developments in the coal situation and the threatened strike on April 1. One of the important features of the question is the amount of coal that a company should carry, and this in turn is greatly affected by the financial situation that many find themselves in.

Under ordinary conditions prudent operation of a company may call for only a small coal pile; say, enough to last just a few days. Other companies, because of local conditions, find that it is necessary to maintain forty or fifty days' supply at all times. Now, in the event of a strike what are these companies to do? That is a question that has been asked frequently of the AMERICAN GAS JOURNAL. As expressed by one man:

"Is there any assurance that if I increase my coal supply from, say, forty days to sixty that the situation will be any better in the larger number of days than it would be in the fewer? Then again, if I tie up a lot of money in coal and there is no strike, then I will most surely be condemned for poor management. And just add to that all my other difficulties of having to hold up some bills because I have my money tied up in coal, and you can see something of what I am confronted with."

It was to answer just such questions as these that the AMERICAN GAS JOURNAL has sought accurate and reliable information. The consensus of opinion from those who know seems to be that both the operators and miners are bluffing; that there will be arranged a settlement before the date of the strike, and that it will be averted. At any rate, it is felt that the strike will not be nation-wide and will not really be crippling. Those who hold this opinion point to the strike of last year in West Virginia as showing that the miners are not so anxious to face another possible defeat and, with this facing them, they probably will proceed slowly, even though at the present stage of the game they threaten dire things.

From the standpoint of the public utility, however, guesses or surmises are not worth a great deal; but to reassure the gas company executive, we would like to point out that the United States Government is not going to allow anything to transpire that will seriously jeopardize the well-being of millions of homes. Long before the situation reaches the critical stage we are sure that the Federal Government will have stepped in and aided in solving our coal problem.

A close political observer who watches the situation in Washington with an understanding eye declared that this coal situation had been the subject of considerable discussion among numerous leaders recently and he felt that if the situation showed signs of becoming more than a mere jockeying procedure on both parts it would mean that the Government would step in and take charge. "And," he added, significantly, "if this becomes necessary it is going to be some time before the Government will step out, if ever. In other words, it will mean a close Federal supervision, if not actual control. Don't forget for one minute that there are lots of people down here in Washington who will welcome such an opportunity, too. So, taking the situation at large, I don't think you need fear for the outcome or for a possible shortage."

Accounting Section of A. G. A. to Concentrate on Consumers' Accounting Systems

A very good attendance was had at the first meeting of the managing committee of the accounting section of the American Gas Association, held recently at association headquarters.

There were present Messrs. Ewald Haase, chairman; J. W. Heins, vice-chairman; H. C. Davidson, W. A. Doering, H. J. LaWall, James Lawrence, W. J. Meyers, W. A. Sauer, Wm. Schmidt, Jr., E. C. Scobell, W. G. Sterrett, P. A. Wilson, and W. H. Hartman, secretary.

It was the unanimous decision that the section could render the most constructive assistance to its members by concentrating on the solution of one fundamental problem this year and thrashing it out to a conclusion. After full consideration the managing committee selected the subject of consumers accounting systems as one of the most fundamental problems on which the section could gather information both from the standpoint of:

(a) Improving the service companies render to their consumers.

(b) Reducing the cost of rendering such service adequately.

It was brought out that detailed studies of various systems of consumers accounting were being made by several of our larger companies at the present time. The results of such studies and the comparative efficiencies of new and improved systems actually installed will be included in the accounting section's committee report for thorough discussion and analysis at the convention.

W. A. Doering, of the Boston Consolidated Gas Company, has been appointed chairman of the committee on consumers accounting and in a preliminary outline has tentatively included the following in the matters to be considered by this committee:

Application Department

Consideration of use and form of application cards and possible modifications.

Bookkeeping Department

Relative advantages of the—

Bound ledger (commonly called Boston ledger).
Loose-leaf ledger.
Card systems,
No ledger at all.

Relative advantages of—

Machine bookkeeping versus hand method.
Machine billing versus hand method.
Machine bookkeeping and billing in one operation.

Collection Department

Relative economy of mailing bills to consumers or of delivery by collector who would make collection on presentation of bill. Advantages of the tickler coupon used in case of delinquent payments.

The above, of course, can only be considered as a preliminary outline of the broad field of economy and improvement in the handling of consumers' accounts which is open to the committee's consideration. It was agreed that members of the committee should arrange to visit gas companies where new and improved systems have been installed to personally inspect and study the results and economies accomplished. Representatives present at the meeting of companies who have recently been making a study of this problem pledged their full co-operation to the committee, and it is hoped that all our members having knowledge of developments in the committee's field will communicate to the chairman, W. A. Doering, in care of the Boston Consolidated Gas Company, Boston, Mass.

Continuous Inventory of Fixed Capital

H. C. Davidson, Consolidated Gas Company of New York, was appointed chairman of this committee and, since the meeting, good progress has been made in the committee's organization. The committee's report this year will include a description of the various system of continuous inventories at present in operation by member companies, the uses to which they have been put, and the comparative advantages of the various methods of keeping the inventories up to date. For this purpose there are being secured as members of the committee accountants connected with companies having continuous inventories in force. A discussion of the practical advantages of the inventory both in commission cases and in the writing off of property abandoned will be included in the report.

State Representatives and Contributions to Monthly

W. A. Sauer, of the Peoples Gas Light & Coke Company, was appointed chairman of the above committee which will continue its valuable work of keeping members posted as to the accounting and commercial office practices of gas companies. With a representative in practically every State and district of the country the committee is in a position to secure authoritative information on any question in its field and our members are again reminded that a letter of inquiry to association headquarters or to the chairman is all that is required to place the services of this nation-wide committee at their disposal.

Cost of Main Extensions

The cost of making main extensions and the determination of when such extensions are profitable is a very important consideration with many of our companies supplying growing communities. Policies in this respect, of course, are largely subject to the rules of public service commissions, and a very good resume of such commission rulings was published in the Nov. 10, 1921, issue of "Public Utilities Reports Annotated." It was suggested, however, that many companies had not made a scientific analysis of the costs entering into their main extensions, and that such a study could be made by the accounting section with a view to evolving a formula for determining when such extensions would be profitable and warranted. H. J. LaWall was delegated to make a study of this subject and to report at the next meeting of the committee. It will then be decided whether the material developed will be presented as a paper at the convntion or published in the A. G. A. Monthly.

W. J. Meyers was reappointed as chairman of the committee on standard classification of accounts and the committee on fire insurance rates was continued with P. A. Wilson, of the United Gas Improvement Company, as chairman.

The next meeting of the managing committee will be held in Chicago on March 14.

Unsaturated Hydrocarbon Constituents of Gas

(*Continued from page* 188.)

Summary

1. The unsaturated hydrocarbons of the gas produced by distilling a water-gas tar-coal mixture in a gas retort were collected for study by removing them as their dibromide derivatives.

2. The identity and approximate amounts of these unsaturated hydrocarbons have been determined.

3. The identification of most of the compounds contaminating the dibromides of these hydrocarbons has been made.

The writer wishes to acknowledge the valuable suggestions and assistance of A. C. Fieldner, supervising chemist, and J. D. Davis, assistant supervising chemist, of the Pittsburgh Station, and the courtesies of the officials of the Trent Process Corporation.—Reports of Investigations, U. S. Bureau of Mines.

Developments in Gas Technology

Important Information Gathered from All Parts of the World

By ISMAR GINSBERG, B.Sc., Chem. Eng., Associate Editor

New Gasoscope

An instrument for detecting leaks in gas mains, called a gasoscope, has ben introduced in Austria. This instrument consists mainly of a clay slab, which is connected with a membrane and an indicating device. The gas diffuses through this slab and exerts a pressure on the membrane which is transferred to the indicator. The apparatus is made by the Brennstofftechnische Studienbureau Prof. Hugo Strache, of Vienna, Austria.

Apparatus for Gas Analysis

H M. Lowe in the *Journal of the Society of Chemical Industry*, 1922, page 11, describes an apparatus, shown in the accompanying cut, which may be used to determine rapidly the ammonia in waste gas liquor and for the technical analysis of gas. A is an ordinary gas burette and is filled with dilute sulphuric

acid and fitted with a leveling bottle B. A is permanently connected by pressure tubing to a single absorption vessel filled with mercury which is made to serve for all the absorptions and the explosion as well. The burette is water jacketed, which is not shown in the figure. The absorption bulb is about 200 cu. cm. in capacity and has a three-way cock C. This makes connection to the burette B, to the atmosphere and for the introduction or expulsion of the gas or reagents. Platinum wires are fused into the bulb at D and serve to pass an electric spark. At the bottom of the bulb there is a cock E which remains open except when explosion takes place. Connected thereto is a length of tubing and a mercury reservoir, capable of being held in either of two positions, 1 and 2. The entire apparatus is fastened to an iron stand. The burette holds 100 cu. cm. from the point on the stopcock C.

The article gives a detailed description of the working of the apparatus. The apparatus is easy to manipulate and gives results which are much more accurate than those obtained with the ordinary Orsat apparatus. A small quantity of fresh reagent is used for each absorption.

A slight modification of the apparatus permits its use in the determination of ammonia in waste ammoniacal liquors by decomposition with sodium hypobromite. The decomposition of the liquor takes place in the bulb and the evolved gas is measured in the burette A.

New Bland Patented Burner

This new burner is provided with an arrangement for making very fine adjustments of the valve admitting air to the primary air chamber. The accom-

panying diagram shows the burner. The air adjuster works on a ratchet with two movable shutters under a cone-shaped dust cap. It can be operated with the burner in operation by merely turning the button. Right below the ratchet air piece is a Venturi Bunsen tube. The burner is designed for use with low grades of gas as well as gas of high quality.

Treating Gas Liquor for Fertilizer Purposes

The Gesellschaft fuer Landwirtschaftlichen Bedarf, G.m.b.H., has been granted British Patent No. 153,006 on a process of rendering gas liquor usable as a fertilizer. Gas liquor is too poisonous to be used directly as it kills the plants. If, however, the liquor is first mixed with ammonium sulphide or sulphur and distilled, an excellent fertilizer is obtained which has no bad effect on even the tenderest plants. The distillate is quite free from cyanides and sulphocyanides. The composition of the gas liquor must be determined first in order to ascertain the amount

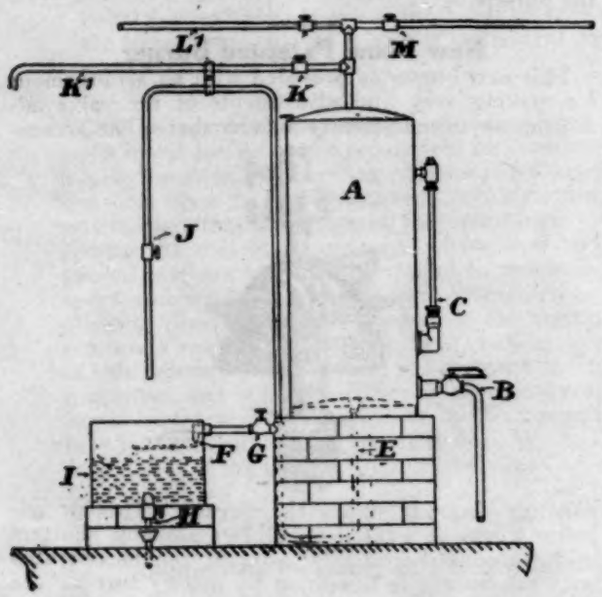
of sulphur to be added thereto. Detailed directions regarding the calculations to be made in this determination are given in the patent.

Gas Burners in Coke Ovens

In British Patent No. 171,464, assigned to the Coke & Gas Ovens, Ltd., there is described an apparatus for the production of coke in which the heating flues are provided with two sets of gas burners supplied from two separate ducts. Each duct is fitted with a three-way valve so that it may be supplied with gas or with air for the combustion of any graphite deposited on the burners. The major supply of air for the combustion of the gas may be preheated, and is admitted to the heating flues independently of the above valves.

Continuous Gas Sampler

The necessity of taking a gas sample which shall represent the production over a long period, say, twenty-four hours, is always present in the gas plant. B. P. Bezant describes an apparatus, shown in the accompanying cut, which can be put together very readily from parts found in most gas works and which gives very good results (see GAS JOURNAL, 1921, 433). A is an ordinary hot-water circulating tank of thirty



gallons capacity. B is the inlet water pipe and valve connected to the main line. C is a water gauge for the purpose of ascertaining the gas in the container A. E is a U tube leading from the bottom of A to the controlling ball cock F. G is a valve used when repairs to the ball cock become necessary. H is a valve, regulating the flow of water from the ball-cock tank I. J is a pipe with valve leading from the U tube E to the tank I. K' is the safety overflow line and L' is the gas-supply line.

The apparatus works as follows: The valves H, I, and M are closed and K, J and G are opened. Then B is opened. As soon as A is full, water will flow from J to I, and there will also be an overflow through K'. The purpose of this line is to make sure that no water flows into the pipe L'. It is well to have about a half inch of oil on the surface of the water in A to prevent absorption of the gas. Very little of this oil will be wasted through J, as only water will flow from this pipe, but if the inlet valve B is not closed instantly that an overflow is noticed through J, then the oil will run out through K. After valves K and B are closed, close valve J. Open M and K for about two minutes and close K. Leave G open and regulate H. The rate of the water leaving the container A is uniform and not influenced by head in A. The valve H is so regulated that all the water in A will be displaced by gas within a certain length of time, that is within twenty-four hours, if a sample of an entire day's production of gas is to be obtained. When the sample of gas has been taken, it can be driven out of A by allowing water to enter through the valve B.

Motor Fuel from Oil Gas

When oil gas is stored under pressure, a light oil is deposited. This oil is agitated and heated under a reflux condenser for about six hours with an anhydrous metal chloride, for example, with two ounces of anhydrous aluminum chloride for each gallon of oil. The still is heated by pressure steam and the temperature is adjusted to maintain the vapor passing to the reflux condenser at 75 to 85 deg. Cent. The uncondensed gas that is obtained in this way, after scrubbing with caustic soda and lime, is used for heating or lighting. The fraction, boiling between 70 and 140 deg. Cent., obtained by subsequent distillation of the oil, after one or more further treatments with small amounts of the anhydrous aluminum salt, is suitable for use as a motor fuel. (British Patent No. 171,556.)

Separation of Clinker and Coke

A process of separating clinker from coke, in which a water bath, which is kept under pressure and in constant motion, is used, is the subject of German Patent No. 328,995. The novel feature of the process is the addition of sand mixed with cement to the water bath. While the fine porous coke absorbs only little of this mixture, the coarser pores of the clinker fill up completely with the sand-cement mass and as a result thereof the weight of the same is increased considerably. The separation of the clinker and the coke is then accomplished very easily by deposition or centrifuging.

Illuminating Gas from Bituminous Shale

The gas that is obtained from the distillation of bituminous shale is led over or through an incandescent carboniferous substance. At the same time oil gas and the carbon dioxide gas, obtained from the limestone derived from the shale, are introduced into the reaction chamber. The mixture of the three gases and the resulting reactions produce a gas which has a heating value of 3,500 to 4,500 calories. The entire operation is carried out in retorts of the type used in shale distillation. The shale is distilled in one set of these, the gas is passed through another series which contain incandescent coke. Another set is used for the production of carbon dioxide. (German Patent No. 332,155.)

Industrial Uses of Gases

(*Continued from page* 185.)

one of them in the heating zone was subjected to considerable more heat than the other. This led us to believe that possibly the temperatures as indicated on the pyrometers was influenced by their exposure in the combustion chamber. Our customer insisted that the pyrometers were correct, and that they had been checked, but the peculiar part was that we had been able to obtain a good anneal of the copper when the temperature as indicated on the pyrometers, were not suited to annealing. Finally, one day when the representative of the manufacturer was there at the same time we were, the question was put up to him, and he admitted that the temperatures as shown on the pyrometers were not true readings of the working chamber, but that it was impossible to place them where they would record accurately on account of the construction of the furnace, and that the readings should only be used as a guide, so that the man using the furnace would know after a few trials, that when the two pyrometers showed certain readings, and the wire was properly annealed, that by repeating these same conditions the resulting work would be the same. I mention this as some of you may have similar installations, and it may save you some of the trouble we have been put to. Both of the above-mentioned types of furnace use the pressure air one-valve system and the results are very satisfactory.

Carbonizing Steel

In another installation, we are carbonizing steel by means of gas, using the revolving furnaces manufactured by a well-known gas-furnace manufacturer. This furnace consists of a revolving cylindrical retort into which the pieces of steel to be carbonized are placed. The retort is heated by means of gas burners Gas is also admitted to the retort and in passing over and around the work gives off a volatile carbon which is absorbed by the work. The gas issues from the retort at the far end from which it enters and the waste gases burn at this point.

We are all familiar with the difficulties encountered with the packing method. With the system described above, the work is evenly carbonized; carbonizing can be carried on almost indefinitely, as fresh carbon is admitted continuously and the depth of case depends on the length of time the work is left in. There is, of course, a limit to the depth of the case that can be obtained. With the packing method, the depth of case is limited to the amount of available carbon contained in the carbonizing material put in the pot.

There is also a saving of labor in packing and unpacking and in the cost of pots. It should be remembered, however, that the heat treater is limited in the kind of work that is to be done by this method, as the material is tumbled, and large or peculiar-shaped pieces that have edges that are easily broken cannot be handled to advantage.

Melting Aluminum

In another place, we are melting aluminum. In this case, the difference in the results obtained with different types of furnaces is brought out very forcibly. The concern in question brought two furnaces with them from another city, when they came to Boston. These furnaces melted the aluminum satisfactorily, but were very wasteful in gas, and the life of pots was very short, being about twenty to twenty-five heats. We installed a furnace of the low-pressure gas, one-valve control type with burners placed tangentially to the sides of the furnace so that the flame had a whirling motion around the pot. This furnace showed a higher efficiency and the life of the pots was increased from seven to eight times, over that of the other type of furnace. This was due to the fact that with our furnace the combustion was almost perfect, while with the other type the combustion was poor, the proportions of air and gas were continually changing, causing an oxidizing flame at times, and a rich flame at other times. In addition to this, the flame was directed into the furnace in such a way that it struck against the pot. When you consider that pots cost about twenty-five dollars, the saving in pots alone amounted to considerable money.

We are also doing some brass melting. Two types of gas equipment can be used successfully for this work, one of them is easier to install and costs less, and under certain conditions, is a very good equipment to put in. The other type usually requires more work and expense to install but is more efficient, and on a large installation, where efficiency counts, is undoubtedly the best equipment to put in. In the following case, we chose the latter type, as there are a great many furnaces to be changed, and the operating cost is a very important item.

Converting from Oil to Gas

This installation consisted of converting a Schwartz Tilting Furnace, from oil to gas. The method of converting this particular furnace consisted of placing two gas burners in practically the same position as the oil burners, the flames being thrown down into the metal so as to converge and meet at the point where they strike the metal. The composition of the metal was copper, 87 per cent; zinc, 6.25 per cent; lead, 0.50 per cent; tin, 6.25 per cent, and copper, 85 per cent; zinc, 5 per cent; lead, 5 per cent; tin, 5 per cent. We were enabled to obtain one run where 100 lb. of brass were melted with 303 cu. ft. of gas.

One interesting point that was brought out was that there was no gain in the speed of melting by using the maximum amount of gas during the entire run. By running with the gas partially turned down until the metal was heated through, then turning on all the gas possible until the zinc was added, when the gas was turned down again, we were able to obtain the greatest speed and the best efficiency.

In connection with this, it is important to remember that the temperature should be reduced when the zinc is added, otherwise the zinc will be driven off in the form of vapor.

The result of some of the runs is given below:

April 26, 1921

700 lb. Valve Metal—

Meter reading	89.670
Started drying	7:10
Metal charged	7:30

700 lb. Valve Metal—(*Continued.*)

Meter reading	90,420
Chips added	8:10
Zinc and lead	8:25
Metal poured	8:45
Meter reading	93,250

Gas consumption, 404 cu. ft. per 100 lb.
Time of heating, one hour.

700 lb. Comp. Metal—

Meter reading	95,920
Metal charged	10:20
Chips and shot added	10:45
Zinc and lead	11:05
Metal Poured	11:13
Meter reading	98,040

Gas consumption, 303 cu. ft. per 100 lb.
Time of heating, 53 minutes.

700 lb. Comp. Metal—

Meter reading	93,250
Metal charged	8:55
Chips added	9:20
Zinc and lead	9:50
Metal poured	9:55
Meter reading	95,564

Gas consumption, 331 cu ft. per 100 lb.
Time of heating, one hour.

700 lb. Valve Metal—

Meter reading	98,040
Metal charged	11:25
Chips added	12:00
Zinc and lead	12:20
Metal poured	12:35
Meter reading	100,670

Gas consumption, 376 cu. ft. per 100 lb.
Time of heating, one hour and ten minutes.

Shrinkage 3 per cent to 4 per cent.
Average gas for 100 lb. metal melted—354 cu. ft.
Average time of heating—one hour and one minute.

Some five years ago, the first newspaper in Boston changed over its twin eight-ton autoplating pots from coal to gas. This installation proved so successful that other newspapers followed its example, and to-day there are only two dailies which still use coal under their autoplating pots.

Previous to changing over the autoplating pots, gas had been used with considerable success for linotype machines, and generating steam for the matrix pots, and to-day practically all the work is done by gas.

Various types of burners were used, both pressure air and pressure gas, the result in most cases being very satisfactory. It was found, however, that the character or shape of the flame had an important bearing on the results. A short, hard flame did not heat the pot uniformly and was liable to crack the pot, whereas a softer, longer flame which spread out, under and around the pot, gave much better results and was easier on the pot.

There was some question at first as to whether the pots would stand up where gas was used, but there has been very little trouble from this source. Where the proper type of burner has been installed, there has not been a cracked pot in any of the autoplating machines in Boston. Several job pots have been broken where a short hard flame was used.

Some of the advantages of gas are, increased output and speed both of which are of the utmost importance in newspaper plants the temperature of the room is lower and the plant is cleaner and more elastic.

In the case of the American, they would not be able to operate in their present quarters, if coal were used as they are so crowded that the lower production obtained with coal would not be sufficient for their needs.

Every newspaper plant is equipped with two outside services and duplicate meters so that there is a spare one in case of emergency.

Thoughts on the Installation of Appliances

By E. A. CLARK

Most of the present-day talk is about the sale of appliances. As a matter of fact, the sale itself is only one-half of our battle. Fully as much depends on the manner in which the appliance is installed.

We all know that a sale of any appliance is not completed until the customer for whom that appliance is installed is satisfied that it is just what he has needed, and the gas company is handing out a monthly receipted bill for the gas consumption on that appliance.

The piping connections of appliances should be carefully thought out before work of installing is started, as any perfectly good appliance can be made a poor one if connections are improperly made, while a comparatively poor appliance can be made to work fairly well, if thought and care are given to the installation.

We, in Boston, are perhaps fortunate in having a good class of fitters who are specially trained, inasmuch as we develop practically all our own fitters We first use them as helpers, dividing them into three classes: the green men, fairly good helpers, and experienced helpers. When they become experienced helpers, we put them through a light written and oral examination, and if they get a certain percentage in this, we make them apprentice fitters, giving them a little more money, and a chance to do some work under a regular fitter. After working in this way for a short time, we send them to City Hall for an examination. If they pass that we put them on as regular fitters, of which we have four classes. Class A1 covers men experienced in all kinds of installation work, as well as operation of appliances and utilization of gas. In this particular class, all must have been in the employ of the company for at least ten years. Class A fitters must have all of the Class A1 requirements except length of service. They are promoted from Classes B and C, according to their ability. Class B differs from Class A principally in the length of service and experience. Class C requires experience with only domestic, lighting and water heating appliances. Class D is for entering apprentices. A new fitter who has just received his license enters Class D, and as he increases in efficiency, he goes along to the other classes. We find this a much better way of getting good men than developing outside fitters who do not have this training. In a rush of work that we recently had, we found it necessary to 'et some of it to outside shops, and we are still reaping the results of their poor work.

An Installation Kink

We are much in favor of running a larger size pipe to an appliance than the appliance calls for, and no doubt this keeps us out of some bother from partial stoppages, etc.

We have installed at our shop a working demonstration of tank, automatic, and storage system water heaters. The piping to these heaters is so arranged that any one of them can be shown on non-circulating direct street pressure, circulating direct street pressure, or reheating systems, as well as tank pressure systems. The piping of each system is painted a different color, so that we are able to demonstrate the action of each individual system. If the fitters find some trouble with a water-heating system on their work, we can reproduce that trouble at the shop and show the remedy for it. The piping is so arranged that we can produce pockets, air cushions, water hammers, etc. We connect all our tank water heaters with three-quarter-inch iron-sized brass pipe and, wherever possible, we use a quick action coupling. These are brass connections or spuds made in different styles, some of which are split, and others are one piece, as far as boiler spud is concerned, but they all have a washer and lock nut or union which holds them in place. The use of this coupling does away with the need of a union. It also does away with any chance of water by-passing from heater to fixture, thereby giving lukewarm or cold water. It also makes a very convenient connection, if top of boiler is close to ceiling, or the piping is old or apt to start leaking when working on it. We cut the upper coupling in about four inches from the top of the boiler, and the lower one about four inches from bottom of boiler.

As to Steam-Boiler Connections

Regarding steam-boiler connections, each steam-boiler installation should be considered separately, as two jobs that may appear alike to the casual observer, sometimes have to be installed in an entirely different manner. I might mention that where we use a direct return trap system, we always take the live steam to trap from boiler, or close to the boiler and not off the line, some distance away. This gives us a uniform steam pressure on our line to trap. We keep this line at least one size larger than the trap calls for. We also believe in separate returns from each appliance to receiver wherever practicable. Some people seem to have an impression that a direct return trap cannot be successfully operated where we have less than twenty or twenty-two pounds steam pressure. We are efficiently operating, at least two, which carry only from twelve to fifteen pounds steam pressure. When such an installation is being made, the suction pipe between receiver and trap is kept larger than trap calls for and 45 deg. ells are used in place of 90 deg. ells. Under these conditions these traps can be made to operate perfectly. We never install a gravity system unless the bottom of kettle, coils or appliances is at least two feet above the water line of boiler.

We have found in some cases that it is better to use the electrically operated pumps with receivers. These work very satisfactorily. We use these where we have insufficient height for direct return trap. We think they are more positive in operation, and another good feature is that they can be used as automatic boiler feeds on high pressure installations. In fact, while the trap is cheapest, it is often better to use the pump. We have some of these working on twin boiler installations, and by regulating the valves on the return, between pump and boiler, we get the condensation back into each boiler very easily. We have cases where we have installed two boilers of different sizes, set side by side, so placed that the water lines are at the same level, and we are able to return the condensation very evenly with a direct return trap, by using fittings to restrict the flow to the boiler, that takes the condensation the fastest.

There are a great many different means of making a steam boiler work right, and if the proper size boiler is sold, some one of the different systems of installations can be made, and a very satisfactory job will result. We seem to have very little, if any, trouble on our own installations. Sometimes, we meet a customer who wants the job installed his way, but he generally gets around to our way of thinking before we get through with him.

Right here, I want to say that I believe that appliances should be shown in a working exhibit at every yearly convention. It would be one of the very best investments that a gas company could make, to send as many fitters as possible to examine such appliances in working condition. Further than this, I believe that the superintendent and foreman of the shop should, from time to time, be sent to investigate installations in other cities, as, no matter how much we think we know, the other fellow may have some mighty good information also.

Co-operation and Good-will of Public Are Necessary for Best Service, Says Thompson

In an address before members of the Pittsburgh Advertising Club, at a recent weekly luncheon of the organization, President W. A. Thompson of the Philadelphia Company stated that only through the co-operation with and the good-will and the confidence of the public and public officials towards public utility companies, can those companies be successful and render to the community the service which that community desires and to which it is entitled. In speaking on the subject, "How Advertising Can Establish Friendly Relations Between the Public and Public Utility Companies," Mr. Thompson declared this is being accomplished in Pittsburgh through giving the public all the information available regarding the problems now confronting the utilities, saying he found that when the public are given the facts in a matter they may be depended upon to act justly and fairly and to decide these problems for the best interests of all concerned. In discussing the natural gas situation, Mr. Thompson said that with proper conservation, this fuel will be available for the people of Pittsburgh for cooking and water heating for from forty to fifty years. He stated that he is confident the people, with a proper understanding of the situation, will be willing to pay a little more for this fuel which contains more heat units than manufactured gas and only costs one-third as much.

Public Utilities Securities Market Report

Prices of Representative Gas Bonds

(Quotations furnished by The National City Company)

Company	Issue	Maturity	Feb. 23, 1922 Bid	Asked
American Lt. & Trac. Co.	Five Year 6s	May 1, 1925	99½	100¼
Brooklyn Union Gas Co.	First Consol. 5s	May 1, 1945	88	90
Columbia Gas & Elec. Co.	First 5s	May 1, 1945	90	91
Consol. Gas, Elec. Lt. & Pr. Co. of Baltimore	First Ref. 7½s	Dec. 1, 1945	105½	107
Consol. Gas, Elec. Lt. & Pr. Co.	General 4½s	Feb. 14, 1935	86	87
Consol. Gas Co. of New York	Sec. Conv. 7s	Feb. 1, 1925	104	104¼
New Amsterdam Gas Co.	First Consol. 5s	Jan. 1, 1948	72	75
Denver Gas & Elec. Co.	Gen. (now 1st) 5s	May 1, 1949	85	87½
Detroit City Gas Co.	Gold 5s	Jan. 1, 1923	97	99
Equitable Illum. Gas Lt. Co. of Philadelphia	First 5s	Jan. 1, 1928	95	98
Hudson County Gas Co.	First 5s	Nov. 1, 1949	86	88
Laclede Gas Light Co.	Ref. & Ext. 5s	Apr. 1, 1943	86	87
Louisville Gas & Elec. Co.	First & Ref. 7s	June 1, 1923	99½	100½
Michigan Light Co.	First & Ref. 5s	Mar. 1, 1946	85	88
Milwaukee Gas Light Co.	First 4s	May 1, 1927	88½	90
Pacific Gas & Elec. Co.	Gen. & Ref. 5s	Jan. 1, 1942	87½	88
Pacific Gas & Elec. Co.	First & Ref. 7s	Dec. 1, 1940	103½	105
Cal. Gas & Elec. Corp.	Unif. & Ref. 5s	Nov. 1, 1937	94	95
Peoples' Gas Lt. & Coke Co.	Refunding 5s	Sept. 1, 1947	85¼	86
Chicago Gas Lt. & Coke Co.	First 5s	July 1, 1937	92	93
Portland Gas & Coke Co.	First & Ref. 5s	Jan. 1, 1940	87	89
Seattle Lighting Co.	Refunding 5s	Oct. 1, 1949	79	81
Southern California Gas Co.	First 6s	Nov. 1, 1950	94	98
Utica Gas & Electric Co.	Ref. & Ext. 5s	July 1, 1957	86	89
Washington Gas Light Co.	General 5s	Nov. 1, 1960	88	89¼
Western States Gas & Elec. Co. of California	First & Ref. 5s	June 1, 1941	85½	87

Reclassification of Pacific Gas & Electric Stock

San Francisco, Cal.—Formal approval of the reclassification of the present authorized capital stock of the Pacific Gas & Electric Company was given by stockholders at a special meeting recently, called for the purpose of considering the change recommended by the directorate. The approval was given by 80 per cent of outstanding shares.

Under the new classification the authorized stock of the company will total $160,000,000, divided into $80,000,000 par value of preferred and $80,000,000 of common. On Oct. 31 last there was outstanding $39,930,930 par value of preferred, including stock subscribed for but not fully paid and issued, and $34,004,058 par value of the common stock.

There is no intention of increasing the amount of stock now outstanding in the hands of the public.

The change merely makes provision for new capital when needed for acquisitions, additions, betterments and improvements that may be authorized by the Railroad Commission.

Gain in Profits of Peoples Gas Company

Chicago, Ill.—The operations of the Peoples Gas Light & Coke Company during the year ended Dec. 31, 1921, were far more profitable than during the preceding twelve months, according to the earnings statement just made public. It shows net income after expenses, depreciation, interest charges, etc., of $4,484,009, compared with $380,752 in 1920.

The company's operating revenues during the year just closed were $31,927,063, compared with $31,236,335 in the year previous. Operating expenses reveal a drastic decrease at $21,488,548, against $26,081,383 in 1920.

The balance sheet as of Dec. 31 last shows cash on hand $2,051,534, against $710,301 on the same date, 1920. Surplus totaled $14,808,122, against $10,718,084, and total assets and liabilities amounted to $115,797,609, against $115,173,862.

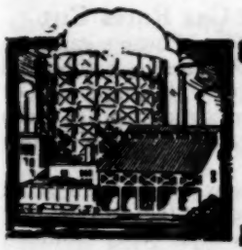
San Joaquin Light Stock Is Non-Callable

Los Angeles, Cal.—Cyrus Peirce & Co announce that at a meeting of the stockholders of the San Joaquin Light & Power Corporation held recently the call price of the per cent cumulative prior preferred stock was removed. This action of the stockholders was confirmed at a meeting of the directors held following that of the stockholders.

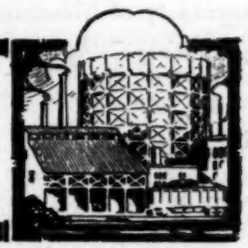
The removal of the call feature of the preferred stock greatly enhances its value as it makes the stock non-callable. The action of the company was forecast a short time ago when a syndicate composes of Cyrus Peirce & Co., Banks, Huntley & Co., and Blyth, Witter & Co. first offered this stock.

Extensive Improvements in 1921

Atlanta, Ga.—The 1921 report of the Georgia Railway & Power Company, recently announced, states that the company invested during the year in improvements to the gas service in Atlanta and Decatur, the latter an Atlanta suburb, $358,741.71. Extensive improvements are also planned to be carried out during the present year.



NEWS OF THE GAS INDUSTRY



New Railroad Commission to Have Charge of Rate Matters

Columbia, S. C.—In a bill passed recently during the present session of the South Carolina Senate the creation of a new State Railroad Commission to have charge of rate matters and public utility operations in this State, and to consist of seven members instead of three, as at present constituted, is provided, the new railroad commission to also consolidate with the present Public Service Commission. Under the new law, if the bill also passes the House, one member of the commission will be elected from each congressional district in the State.

Gas Hearings Open March 13

Macon, Ga.—Ten gas companies in Georgia operated under private ownership have been cited by the State Railroad Commission to appear before the commission in March and show cause why their gas rates shall not be revised. The hearings will begin March 13 and last through March 17. This action follows the recent decision of the commission in reducing the gas rate in Atlanta from $1.65 to $1.55 a thousand cubic feet.

The gas companies against which rule nisis were issued by the commission are located in the following cities: Augusta, Athens Brunswick Columbus, Griffin, Macon, Savannah, Americus, Valdosta and Waycross. The rates in these cities range from $1.75 to $2.10 a thousand cubic feet.

No citation was issued by the commission against several gas companies which are owned by municipalities in Georgia. The gas companies of Rome and Atlanta were not included in the citation because the Atlanta case has been decided recently and a case involving gas rates in Rome is now pending before the commission.

The hearings are set as follows: March 14, Waycross and Valdosta; March 15, Athens and Augusta; March 16, Brunswick and Americus; March 17, Griffin and Columbus; March 13, Macon and Savannah.

Customer-Ownership Results for January

The customer-ownership campaign at the operated properties of the Standard Gas & Electric Company during the month of January, resulted in 1,724 sales, having a par value of $781,050. The companies which sold their securities direct to the public were Northern States Power Company, Louisville Gas & Electric Company, Oklahoma Gas & Electric Company, Arkansas Valley Railway, Light & Power Company, San Diego Consolidated Gas & Electric Company, Western States Gas & Electric Company, Mountain States Power Company and Tacoma Gas & Fuel Company.

John A. Britton to Lecture at Princeton

San Francisco, Cal.—John A. Britton, vice-president and general manager of the Pacific Gas & Electric Company, has been selected by Princeton University to lecture at the University April 4 on "Pacific Coast Public Utility Development."

The lecture will deal largely with the engineering features of electric power generation, both steam and hydraulic, and will describe the leading characteristics of the high tension transmission and interconnecting systems in California. Combined with engineering details will be the romantic story of the development of hydro-electric power plants in the California through the agency of the old-time reservoir and ditches that were used in hydraulic mining during pioneer days.

Gas Plant Makes Service Record

Fond du Lac, Wis.—The Eastern Wisconsin Electric Company might write a book on industrial efficiency under the title of "Twenty Days" and attract the attention of the public utility world. But the company has spent its time doing its job, not writing about it.

A terrific explosion and the fire that followed destroyed one of the buildings and much important equipment at the gas plant. Twenty days later the material destroyed had been replaced and the new equipment was in operation.

Remarkable as this speedy replacement of its plants was, still more remarkable was the fact that at no time, not even immediately after the blast that wrecked the plant, was the service to the gas company's patrons interfered with in the slightest. Had it not been for the noise and the reports of the explosion, gas users might well have gone on using gas without being aware that the company had suffered any damage.

The record of the clearing away of the demolished structure was extraordinary. The explosion occurred early in the morning. While the service was continued without interruption on the reserve tanks during the day, crews of skilled men attacked the heaps of rubbish left by the blast and by night had the site ready for the erection of the new building and machinery.

Twenty days later this had been completed and the plant was once more running normally—a record for service to its patrons that could not be excelled by any public utility in the country.

THE DENVER GAS AND ELECTRIC LIGHT COMPANY has made arrangements for the payment at maturity of the $2,000,000 two year 7 per cent notes of that company maturing on March 1.

Necessity of Minimum Charge

Pittsburgh, Pa.—Many employees have no doubt been asked why the gas companies feel it necessary or right to impose a minimum charge of $1 each month on their customers, even though 2,000 ft. of gas is not used. It is well for employees to know that this minimum charge is only part of the cost each month for each customer to the gas companies to render service aside from the value of the gas furnished. As a matter of fact, it costs natural gas companies approximately $1.50 each month to take care of each individual customer, not taking into account the value of any gas furnished or the cost of its transportation.

Gas companies must stand prepared to render service at all times whether the consumer desires a small amount of gas or a large amount, or no gas at all. This necessitates a heavy investment upon which the gas companies must obtain some return. Otherwise they would not be able to continue such service. Part of the investment in the main pipe line in the street is charged to the individual customer, as is that of the service main, the meter and meter connections, the costs of their repair and their inspection, the reading of meters and rendering of bills. In addition to all this men must be maintained day and night on duty to keep distribution and transportation systems compressing stations and wells in condition in order that instant service may be rendered when the customer demands it.

A man may rent a house and leave it unoccupied several months in the year but he never considers it right or necessary to demand a rebate from his landlord for his lack of use of the property. The landlord has his investment and he expects and requires a regular return on that investment whether his tenant makes full use of the property or not. Yet this same tenant may object to the payment of a minimum charge for the right to use gas when he pleases simply because he may not find it personally expedient to use gas for certain periods during the year.

At present gas companies are not making an arbitrary charge of $1 per month in addition to the value of the gas used. They are merely charging for service plus the gas used to a minimum amount of $1 a month. The probabilities are that all gas companies will find it necessary in the future to make a fixed monthly charge for service in addition to the value of whatever gas is used. Employees can be of assistance in explaining to customers who misunderstood the necessity for a minimum charge why it is so vital that this should be done. Service can only be possible when gas companies receive sufficient revenue to continue rendering service. Service, after all, is what customers want.—*Public Service Employees' Magazine of Philadelphia Company.*

Estimated Future Production of Oil

According to the Geological Survey, the Gulf Coast, Texas and Louisiana region has an estimated supply of oil for future production of 2,100,000,000 bbl. Oklahoma, 1,340,000,000; Texas, 670,000,000 bbl.; northern Louisiana and Arkansas, 525,000,000 bbl.; Wyoming, 575,000,000 bbl.; Illinois, 440,000,000 bbl.; Kansas, 425,000,000 bbl.; Pennsylvania, 260,000,000 bbl.; West Virginia, 200,000,000 bbl, and Ohio, 190,000,000 bbl.. The Texas figures do not include the Gulf Coast section.

Forty-Cent Service Charge in Rome Is Ruled Out

Rome, N. Y.—The Public Service Commission fixed $1.65 a thousand cubic feet as the maximum rate to be charged for gas by the Rome Gas, Electric Light & Power Company in Rome. Present rates are a charge of 40 cents a month for a meter charge and $1.60 a thousand cubic feet for the first 5,000 cu. ft., with a decreasing rate to over 600,000 cu. ft. where the commodity rate is 95 cents a thousand cubic feet.

The new maximum rate is until Dec. 31, 1922. And until the further order of the commission the decision entirely eliminates the service charge of 40 cents a month.

The new company is directed to file a new tariff within ten days after service of the order. The order permits the company to include in its new schedule decreased rates below the maximum for the larger consumers of gas.

Portage Gas Rates Cut

Madison, Wis.—Portage gas rates were reduced 25 cents a thousand feet in all steps, with a minimum of $1 a month, in a recent order given out by the State Railroad Commission.

The rates now range from $2.15 per thousand cubic feet for the first two thousand, to $1.75 per thousand for quantities over 20,000 cu. ft. Rates become effective for the gas sold subsequent to the next meter reading.

More Gas for Burning

Burlington, Kan.—The people of this city are rejoicing over the fact that Mr. Hale, owner of the Hale Gas Company, who has been attempting to furnish gas to this city, has purchased the 3,000,000-ft. well recently brought in near Neosho Falls and work is now under way to attach this well to the Burlington line, according to word from H. A. Cartright, manager here.

Talk on Problems of the Public Utility

At a meeting of the Colorado section of the American Society of Mechanical Engineers at the Metropole Hotel in Denver, Jan. 27, Robert C. Newbury, of the Denver Gas & Electric Company gave a talk on "Public Utility Problems."

George Darris, general manager, Gilbert & Barker Manufacturing Company, Springfield, Mass., addressed a meeting of the American Society of Steel Treating at Providence, R. I., on coal, oil and gas fuel.

Consumers Will Take Part in Natural Gas Convention

Consumers and producers of natural gas will hold a get-together meeting in connection with the annual convention of the Natural Gas Association of America, to be held in Kansas City, Kan., May 15 to 19, according to the statement made by Edward A. Jennings, Pittsburgh, Pa., field director of the association. Mr. Jennings was here in conference with the officials of the Missouri and Kansas gas companies, and making arrangements for the coming convention.

A most elaborate exhibit of appliances for the conservation of gas will be staged in connection with the meeting of the gasmen, and the housewife will be given an opportu-

nity to see the very latest and best appliances for the use of gas in household work.

Mr. Jennings announces that an outstanding feature of the convention will be the taking of the public into full confidence and showing them the exact condition of the gas business. It is necessary, he says, to put on a nation-wide conservation campaign for gas, and the public is to be asked to assist in the campaign. All restrictions have, therefore, been removed, and the public will be brought into the gasmen's meeting to the fullest extent possible.

Los Angeles Annual Report

Los Angeles, Cal.—The annual report of the Los Angeles Gas & Electric Corporation for the year ended Dec. 31, 1921, made public early this year, shows net earnings of $2,330,227, as compared with $2,134,413 in 1920. Interest on bonds increased, however, from $424,845 to $714,169, so that the balance for depreciation, dividends and surplus was reduced from $1,709,568 to $1,1,053. Gross earnings for the year were $9,773,818 and operating expenses and taxes $7,403,591, as against $7,698,247 and $5,563,834, respectively in 1920.

During the year the company added 149 miles of mains to its Los Angeles system, the total mileage now being 1,703. These mains serve 191,258 meters, the number added in 1921 being 22,094.

In the electric branch of its business the company added 210 miles of main wire, making a total now in service of 3,375 miles. Three miles of underground conduit were laid, making twenty-five miles now in service. There were 8,311 electric meters added during the year, the total of these now being 55,697.

The connected horse-power load added during the year was 23,987 making a total of 116,607 horsepower now in operation.

The rated capacity of the company's plants is as follows: Gas generating plant, 52,470,000 cu. ft. per twenty-four hours; holders, 15,000,000 cu. ft.; electric generating plant, 43,790 horse-power.

The company's sales last year were: Gas, 8,889,308,900 cu. ft.; electricity, exclusive of arc street lighting, 61,140,357 kw. hr.

All of the retiring officers and directors were re-elected at the annual meeting of the company.

The Newest in Gas Appliances Shown at Homes Exhibit

At the Better Homes and Buildings Exhibition in the Convention Hall at Kansas City, Kan., Feb. 6-11, there were 100,000 people who had the opportunity to see what was new in the way of gas appliances for the better home.

This, first of the kind in that city, was a greater success than the management had dared to hope. The show was put on by the Real Estate Board, and it was assisted by the architects and builders, as well as by the building material men of all kinds. It is the expectation that there will be an annual convention of the kind there.

Among the gas exhibits, the Kansas City Gas Company had the best location, just inside the main entrance. The gas company's booth was in the shape of a room with a fireplace in it, in front of which was placed a Radiantfire heater. On a table where the crowds could see plainly, was another heater, which was fitted up for exhibition purposes. The burners of the heater were so arranged that they could be drawn out and the relative amount of heat thrown out by the jets of gas inside the heater and outside of it tested by holding the hand near the flame.

Names and information as to the amount of gas equipment owned in families were secured by giving away a heater to the lucky one who should fill up a card and draw the right number.

A number of gas appliances were shown by other companies. The gas water heaters were represented by the American Automatic, the Pittsburgh Automatic and the Royal Automatic gas water heaters and the Lion automatic storage system. Each of these had a booth, and each was fitted up to the water and the gas main so as to show just how the heater worked.

The Clow Gasteam radiator, which is a system by which steam is generated by gas and then circulated through a radiator built directly over and in connection with the burner, occupied a booth. Each radiator is a complete system to itself, and is operated entirely independent of any other radiator that may be in the house. "Steam Heat Without Coal" is the attractive placard that is displayed over the radiator booth. A number of gas ranges were displayed in various parts of the building by hardware and stove companies. The most pretentious display of these ranges was by the Security Range Company.

The Jarvis burner for gas and oil, for use in a variety of stoves and furnaces, occupied a prominent place in the stove and furnace section. In competition with the gas appliances were electrical and oil appliances, in the way of heaters, ranges and kitchen and laundry conveniences.

California's Oil Production in 1921 Greatest in History of State

Los Angeles, Cal.—The greatest production of oil in the history of the State and the lowest consumption during any year since 1915 was the record made in the California petroleum industry during 1921, according to figures compiled and made public recently by the statistical bureau of the Independent Oil Producers' Agency. The total consumption of oil during the year was 102,629,470 barrels, while the production totaled 114,566,901 barrels. Nineteen-twenty was the peak year for both items. During that year consumption ran to 113,904,251 barrels and the wells pumped out 105,618,706 barrels.

Last year was the first time that the production of oil in that State was greater than the amount consumed. In part this was occasioned by the high prices for crude in 1920, which, through the familiar workings of the law of supply and demand, gave the stimulus for the greater production and resulted in the organization of hundreds of small companies which are seeking petroleum in all parts of California, particularly southern California near Los Angeles. This continual search has resulted in the erection of 1,082 rigs during 1921 and an average per month of 536 wells drilling.

California has been very well prospected, says the report, for since 1916 six new fields have been opened, including two last year. The Montebello field, eight miles east of Los Angeles, coming in during 1917, the Richfield district in Orange County in 1918, the Elk Hills district in 1919, the Huntington Beach field in 1920 and the latest Signal Hill fields, near Long Beach, in 1921—all served to swell the totals of California petroleum production. Signal Hill and Santa Fe Springs were the new fields opened last year. The Long Beach territory should show a good production in 1922, according to the report. The Santa Fe field is characterized as the most important dis-

covery in years, as the oil there is all of high grade, running over 30 gravity. However, "the field appears to be a treacherous one and the handicaps many, but they will be overcome as they have been heretofore in every field to date."

Oil in storage was increased 60.85 per cent during the year, and 31,556,277 barrels were on hand Jan. 1, 1922.

During December, 1921, 37 new wells were completed with an average daily production of 10,742 barrels. Twenty-seven wells were abandoned, 528 were in the process of drilling and 9,896 were producing. A total of 10,094,549 barrels were produced during the month.

According to the same report, the petroleum industry is in good condition and optimism is the keynote for the coming twelvemonth: "As to the future, conditions should improve materially and thus create a large consumption to offset an impending surplus by overproduction in 1922. Production and consumption should be more stable."

New Holder for Vallejo, Cal.

The Stacey Manufacturing Company, Cincinnati, Ohio, has been awarded the contract for furnishing and erecting a three-lift 500,000 cu. ft. capacity gas holder for the Pacific Gas & Electric Company at Vallejo, Cal. The work of erection will be commenced shortly, as the foundation for the holder has already been built. George H. Cressler, general sales manager for the Stacey Manufacturing Company, has been out on the Coast during January and reports improvement of conditions in that territory, with an encouraging outlook.

Empire to Open New Refinery March 1

Empire Refineries, Inc., subsidiary of Cities Service Company, have completed arrangements for the opening of their refinery at Gainesville, Tex., on March 1. The company's business has increased to such an extent during the past few months as to render necessary an additional supply of refined oils. Gasoline and fuel oil are the two products where consumption has been well maintained during the fall and winter, and available stocks for both products for spring and summer consumption are much needed. An increase in export demand also plays an important part in connection with the products from this company's refineries.

The opening of the Gainesville plant will bring the operations of Empire Refineries, Inc., up to about 75 per cent of their 1920 activities.

Elrama, Pa., Gas Plant Has Most Modern Equipment

The Elrama gas plant, owned by the Philadelphia Company and operated by the Equitable Gas Company of Pittsburgh, subsidiary of the Philadelphia Company, has the most modern equipment possible to obtain in such a plant. The facilities consist of a producer and a water gas plant. The producer plant was built in 1917 and has a rated capacity of 18,000,000 cu. ft. per day. The water gas plant was completed in 1920 and has a rated capacity of 12,000,000 cu. ft. per day.

This property is so arranged that the producer gas plant may finally be used to heat retorts of by-product coke ovens and the coke made used in the water gas plant. The water gas and by-product gas will be mixed with natural gas about one mile north of the plant. The producer gas plant was, in fact, built for this purpose and is used in the meantime to supplement in a very small proportion the supply of natural gas to the city of Pittsburgh during the winter.

The water gas plant is of the very latest design with practically no heat losses, the heat of blast gas of the water gas machines ordinarily lost being used to furnish steam in specially designed boilers and the exhaust steam from the blowing apparatus being used in place of live steam to generate gas. The plant is equipped with two compressors with 3,000 horsepower, which are used in connection with regulating pressure so that the gas output can be carried to the high-pressure mains and transported for distribution.

To Erect Liquid Purification Plant

The Koppers Company has been awarded a contract for a Koppers liquid purification plant by the Battle Creek (Mich.) Gas Company. This plant will have a daily capacity for handling 2,000,000 ft. of gas per day. A plant of this type has been in operation for over a year at the Seaboard By-Product Coke Company's plant at Jersey City, N. J., handling the entire gas output of that company, amounting to over 25,000,000 ft. of gas per day. This method of gas purification has aroused a great deal of interest in the gas industry and was fully described in a paper read before the last meeting of the American Gas Association in Chicago.

Gas Plant Improvements

The Central Illinois Light Company has placed their order for new equipment required to alter the present nine-foot water gas set. This includes the model H reversing valve with the latest design of ash pockets, also complete hydraulic operation of the generator and carbureter blast valves, the reversing valve and the stack valve. With this equipment will be installed the central-control operating station permitting hand control of the entire set with the minimum amount of labor, and so arranged that it is impossible to operate the valves of the set in wrong sequence.

The new equipment has been designed and will be furnished by the Western Gas Construction Company.

Organization of Petroleum Geologists

On Jan. 26, in Denver, Col., a meeting of some of the prominent geologists of the Rocky Mountain regions brought about the organization of the Rocky Mountain Association of Petroleum Geologists.

The association plans hold bimonthly meetings and later on to affiliate with some national association. Now if there is oil beyond what has already been found, in Colorado, she should get it with such an organization.

The officers are Max Bell, president; J. M. Douglas, vice-president; C. B. Osborne, secretary-treasurer.

Sixty petroleum geologists attended the first meeting.

Opens New Office

The U. S. Cast Iron Pipe & Foundry Company, of Burlington, N. J., has opened a new office in the Interstate Building, Kansas City, Mo., which will be in charge of D. W. Pratt, sales agent.